5. For each of the following, determine $f(3)$.

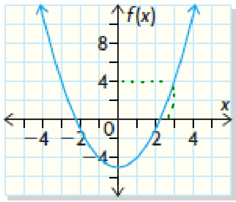
a) $f = \{(1, 2), (2, 3), (3, 5), (4, 5)\}$

b)

x	1	3	5	7
$f(x)$	2	4	6	8

c) $f(x) = 4x^2 - 2x + 1$

d)



Sep 16-9:36 AM

MCF 3M Unit One CH Test

Determine the Degree of the Function

Time (s)	Height (m)
0	0
1	30
2	40
3	40
4	30
5	0

Feb 11-3:37 PM

MCF 3M Unit One CH Test

Δy Δy'

0 0 30 20 -10
1 30 10 -10 0
2 40 0 -10 10
3 40 -10 -10 10
4 30 -30 -20 10
5 0

Time (s)	Height (m)
0	0
1	30
2	40
3	40
4	30
5	0

Non Linear
Non Quadratic

Degree = 4

Feb 11-3:37 PM

Function

A relation in which there is only one dependent variable for each independent variable, only one y for every x.

1 → 10, 2 → 20, 3 → 30, 4 → 40, 5 → 50

1 → 10, 2 → 10, 3 → 10, 4 → 10, 5 → 10

1 → 10, 2 → 12, 2 → 14, 3 → 16, 4 → 18

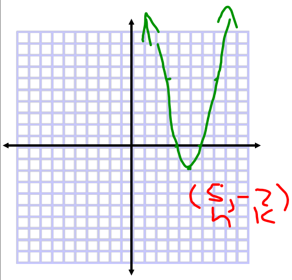
Function – Linear and Quadratic relations

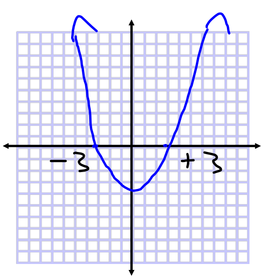
Non-Function – Scatterplot (vertical line test)

4 → 8, 4 → 10, 4 → 16

6 → 41, 8 → 41, 10 → 41

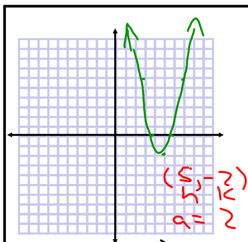
Sep 17-9:45 AM

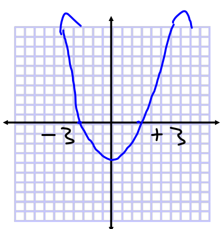




Determine the Equation for Each Function
State the Domain and Range in Set Notation

Feb 18-8:01 AM





$y = a(x-h)^2 + k$

$y = 2(x-5)^2 - 2$

$D = \{x \in R\}$

$R = \{f(x) \in R \mid -2 \leq f(x)\}$

$f(x) = a(x-h)^2 + k$

$f(x) = a(x-0)^2 - 4$

$f(x) = a(x)^2 - 4$

$f(x) = \frac{4}{9}x^2 - 4$

$D = \{x \in R\}$

$R = \{f(x) \in R \mid -4 \leq f(x)\}$

Feb 18-8:01 AM

Substitution

4. If $f(x) = 3x^2 - 2x + 6$, determine
   a) $f(2)$ b) $f(x - 1)$

Sep 16-8:06 AM

Substitution

4. If $f(x) = 3x^2 - 2x + 6$, determine
   a) $f(2)$ b) $f(x - 1)$

$f(2) = 3(2)^2 - 2(2) + 6$
$f(2) = 3(4) - 4 + 6$
$f(2) = 12 - 4 + 6$
$f(2) = 14$

$f(x-1) = 3(x-1)^2 - 2(x-1) + 6$
$f(x-1) = 3(x-1)(x-1) - 2x + 2 + 6$
$f(x-1) = 3[x^2 - 2x + 1] - 2x + 8$
$f(x-1) = 3x^2 - 6x + 3 - 2x + 8$
$f(x-1) = 3x^2 - 8x + 11$

Sep 16-8:06 AM

5. $f(x) = 3(x - 2)^2 + 1$
   a) Evaluate $f(-1)$.
   b) What does $f(1)$ represent on the graph of f?
   c) State the domain and range of the relation.
   d) How do you know if f is a function from its graph?
   e) How do you know if f is a function from its equation?

Sep 16-8:04 AM

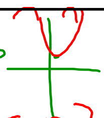
5 $f(x) = 3(x-2)^2 + 1$

$f(-1) = 3(-1-2)^2 + 1$
$f(-1) = 3(-3)^2 + 1$
$f(-1) = 3(+9) + 1$
$f(-1) = 27 + 1$
$f(-1) = 28$

Feb 18-1:55 PM

5. $f(x) = 3(x - 2)^2 + 1$
   a) Evaluate $f(-1)$.
   b) What does $f(1)$ represent on the graph of f?
   c) State the domain and range of the relation.
   d) How do you know if f is a function from its graph?
   e) How do you know if f is a function from its equation?

(2,1) up

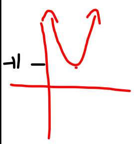


$D = \{x \in R\}$

b) Represents the value the dependent variable when the independent variable is 1.

Sep 16-8:04 AM

5 $f(x) = \underline{3}(x-2)^2 + 1$ up (2,1)



$D = \{x \in R\}$

$R = \{f(x) \in R \mid f(x) \geq +1\}$

$R = \{f(x) \in R \mid 1 \leq f(x)\}$

Feb 18-1:59 PM

Using The TI 83 Determine the Domain and Range of the Function

$f(x) = -5x^2 + 12x + 8$

$D = \{x \in R\}$

$R = \{f(x) \in R \mid f(x) \leq 15.48\}$

Feb 18-2:03 PM

$d(x) = a(x-h)^2 + k$ $(3, 1)$

6. A function is defined by the equation $d(x) = 5(x-3)^2 + 1$.

a) List the transformations to the graph of $f(x) = x^2$ to get $d(x)$.

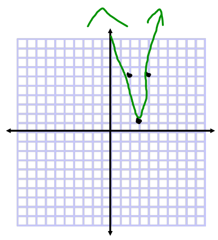
b) What is the maximum or minimum value of the transformed function $d(x)$? $(3, 1)$ minimum value $= 1$

c) State the domain and range of $d(x)$.

d) Graph the function $d(x)$.

a) Stretched by 5
horizontal translation 3 units right
vertical translation up 1

c) $D = \{x \in R\}$
$R = \{d(x) \in R \mid 1 \leq d(x)\}$



$d(x) = 5(x-3)^2 + 1$

×5
over 1 up 1 ×5 5
over 2 up 4 ×5 20
over 3 up 9 ×5 45
over 4 up 16 ×5 80

Sep 16-8:04 AM

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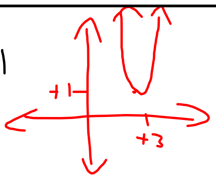
6. $d(x) = 5(x-3)^2 + 1$



a) stretched by 5
horizontal translation 3 units right

vertically translated 1 unit up

$D = \{x \in R\}$
$R = \{d(x) \in R \mid d(x) \geq +1\}$

Feb 18-2:09 PM

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7. A football is kicked from a height of 0.5 m. The height of the football is modelled by the function $h(t) = -5t^2 + 18t + 0.5$, where t is time in seconds and $h(t)$ is height in metres.

a) Graph the function for reasonable values of t.

b) Explain why the values you chose for t in part (a) are reasonable.

c) What is the maximum height of the football?

d) At what time does the football reach the maximum height?

e) For how many seconds is the football in the air?

f) Express the domain and range in set notation.

Sep 16-8:03 AM

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c) What is the maximum height of the football?

d) At what time does the football reach the maximum height?

e) For how many seconds is the football in the air?

f) Express the domain and range in set notation.

x	y
0	0.5
1	13.5
2	16.5
3	9.5
	7.5

vertex $(1.8, 16.7)$

zeros $(3.6, 0)$

$D = \{t \in R \mid 0 \leq t \leq 3.6\}$

$R = \{h(t) \in R \mid 0 \leq h(t) \leq 16.7\}$

Sep 16-8:03 AM

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7. $(1.8, 16.7)$

$h(t) = -5t^2 + 18t + 0.5$

c) max height $= 16.7$ m
max height at 1.8 sec

d) $0 \rightarrow 3.6$ sec
$\therefore$ flight time is 3.6 sec

$D = \{t \in R \mid 0 \leq t \leq 3.6\}$
$R = \{h(t) \in R \mid 0 \leq h(t) \leq 16.7\}$

Feb 18-2:14 PM

Feb 17-8:59 AM